

REMARKS

This paper is responsive to the Office Action dated September 6, 2005. Applicant thanks Examiner Ratcliffe for the analysis contained in the Office Action.

Objection to the Disclosure

Applicant has amended the word "notion" to read "motion," as requested by the Examiner. The objection is thus believed to be overcome.

Claim Rejections Under 35 U.S.C. §103

Claims 1-4 and 6-8 currently stand rejected under 35 U.S.C. §103 as being unpatentable over Hoschette (4,965,453) in view of Falbel (5,189,295). Applicant respectfully traverses this rejection. In claim 1, applicant claims "optical flow motion extraction" to determine "the speed and direction of movement of the body and the orientation of the body in terms of pitch, roll and yaw . . . by monitoring the rate and direction of movement of pixel shift within the at least one viewing region." Hoschette teaches determining the location of an object by sensing a source of energy within a composite field of view, and "adjust[ing] the projectile orientation to locate and maintain the source within the central sector of the composite field of view" (abstract). Hoschette does not teach, and is not concerned with, finding the speed or orientation (in terms of pitch, roll and yaw). Hoschette teaches the equivalent of taking "snapshots" and adjusting the course to keep a target centered, without taking any measurements to determine its current speed or orientation.

Separately, Falbel teaches detecting fixed, known references to determine the roll, pitch and yaw of an object, but is not concerned with the speed or direction, each of which would be constant in a geosynchronous orbit, and would be unnecessary to find. Falbel does not teach a navigation system; rather, Falbel teaches a system to maintain a desired orientation.

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It is respectfully submitted that neither Falbel nor Hoschette teaches using optical flow motion extraction, which requires a comparison with previously detected images to determine degrees of motion. Each uses captured images individually to accomplish their design. In addition, there is no motivation for using optical flow motion extraction with Falbel or Hoschette, as individual images are sufficient. In other words, the response of a satellite or a projectile to a particular image will be the same, regardless of the image immediately preceding it. Applicant's invention requires a comparison with previously captured images to determine pixel shift. The references are also deficient as neither is concerned with speed, and does not teach a method of determining speed. Claim 1 is thus not obvious in light of Hoschette and Falbel. As claims 2-3 and 6-7 depend upon claim 1, these claims are also not obvious.

Claim 8 claims "optical flow motion extraction" to determine "the speed and direction of movement of the body and the orientation of the body in terms of pitch, roll and yaw . . . by monitoring the rate and direction of movement of pixel shift within the at least one viewing region" and is therefore not obvious based on similar arguments.

Claims 5 and 9-15 currently stand rejected under 35 U.S.C. §103 as being unpatentable over Hoschette (4,965,453) in view of Falbel (5,189,295) and in further view of Kasser (5,191,385). Based on the arguments presented above, claims 1 and 8 are not obvious based on Hoschette and Falbel, and Kasser does not make up the deficiency. Kasser is not directed towards a navigation system at all, but rather to determining the topography of the land. As claim 5 is dependent upon claim 1, and claims 9 and 10 are dependent upon claim 8, these claims are also not obvious. Claim 11 also claims "optical flow motion extraction" to determine "the speed and direction of movement of the body and the orientation of the body in terms of pitch, roll and yaw . . . by monitoring the rate and direction of movement of pixel shift within the at least one viewing region" and is not obvious in light of Hoschette and Falbel based on arguments

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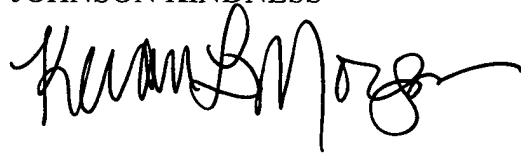
arguments similar to those presented above for claim 1. Applicant respectfully submits that the Kasser reference does not make up the deficiency of Hoschette and Falbel. The Kasser reference is a system that uses ground based retro-reflectors and lasers. Kasser is concerned with timing of pulses from its lasers and does not focus on image processing constructs.

CONCLUSION

In view of the foregoing arguments, applicant respectfully submits that the present application is now in condition for allowance. Applicant, therefore, requests the early issue of a Notice of Allowance.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the below date.

Date: February 6, 2006

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